



FRD ACTIVITIES REPORT

January - March 2013



RESEARCH PROGRAMS

Transport and Dispersion Modeling

The review of the HYSPLIT Radiological Software Quality Assurance plan (HYRad SQA) and its gap analysis required for inclusion in the SCAPA model toolbox is still pending. It is anticipated that the initial reviewer comments will be received by May.

The operational version of HYRad was upgraded with two new calculations requested by the INL EOC. There were two small revisions to correct a units labeling error. Some of the radiological release scenarios were updated at the request of the INL EOC. (Richard.eckman@noaa.gov)

Mesoscale Forecast Modeling

Changes have been made to the WRF runs at FRD in an attempt to improve the skill of the wind forecasts. The number of model vertical levels has been increased from 32 to 51 as a way to provide better vertical resolution in the boundary layer. Recent testing suggests this may improve the forecasts of near-surface winds and temperature. The WRF digital filtering initialization (DFI) option has also been activated. With DFI, the model basically runs backward and forward over short time intervals around the analysis time to create initial conditions that are more dynamically balanced relative to the model configuration. This should reduce model spin-up effects during the early forecast hours. The drawback of DFI is that it increases the model run time. Tests are also under way to determine whether there are benefits to using nested 12 km and 3 km grids in WRF rather than the single 3 km grid now in use. (richard.eckman@noaa.gov)

Probabilistic WRF forecasts based on Bayesian regression methods are now being displayed on the FRD web site. The system essentially uses the past performance of the model to generate probability density distributions of 2 m temperature and 10 m winds at specific facilities within the Idaho National Laboratory. These distributions include information on both systematic and random model errors. The performance statistics are periodically updated as new data come in from the NOAA/INL Mesonet. On the web site, box plots are used to display basic information about the shape of the probability density distributions, including the median, interquartile range, and the span between the 10th and 90th percentiles of the distribution. (richard.eckman@noaa.gov)

Project Sagebrush

In preparation for Project Sagebrush, 562 sampler cartridges have been refurbished and are ready for use in the experiment. The inlet tube on each bag was replaced and all the bags were sealed to eliminate the need for repeated leak checking during the project. The entire FRD staff participated and the project was completed ahead of schedule. The calibration cartridges used for the gas chromatographs (GC)

were also refurbished. We are now replacing the inlet tubing on the 135 existing air samplers and checking them to be sure they are ready for use. (roger.carter@noaa.gov & staff)

Birch Creek Valley Study

This study is designed to measure and improve the understanding and modeling of wind flows in complex terrain using resources and funding available to FRD and its partners. The Fire Sciences Laboratory of the U.S. Forest Service (USFS) was already a key player in both the field study and modeling aspects of the Birch Creek Valley project. In late March Washington State University also stated their interest in participating in the field study. Boise State had previously stated their interest in contributing to modeling efforts related to the project. A proposal to the BLM that covers field measurement activities for BLM administered areas off the INL is in the final stages of preparation. It is anticipated that this will be completed early in April after input from partners has been finalized. BLM review and approval is expected to take 1-2 months. It is hoped that the partners can begin deployment by late May. Measurements will be continuous from that time until sometime in September when much of the instrumentation will be needed on other projects.

FRD's equipment has already been fully operational since just before Christmas. Some of this was detailed in the last quarterly report. One of the sodars was pulled from service in late March due to data recovery problems and sent to the manufacturer for repairs. The database being generated from the field measurements is being consolidated in preparation for the beginning of data analysis.

Specific output from the daily WRF runs at FRD is being archived for the Birch Creek study. This includes vertical profiles at the three locations where FRD is operating sodars and a radar profiler. Plots showing the model horizontal wind field over Birch Creek and vertical cross sections perpendicular to the valley axis are also being archived. The model output will hopefully assist in the analysis of the Birch Creek field data. (Dennis.finn@noaa.gov)

Flux Measurements

Progress was made on a study involving the measurement of carbon dioxide and water vapor fluxes from an arid shrub-steppe ecosystem. This is a multi-year study that is ongoing. Preliminary results have been completed for the years 2007-2009. (dennis.finn@noaa.gov)

U.S. Historical Climatological Network – Modernization

FRD initially developed and then operated, in cooperation with ATDD, several QA/QC programs for the U.S. Historical Climatological Network- Modernization (HCN-M) project. The system has been in operation for the last 3 ½ years. The programs created a number of daily and monthly contour plots that showed targeted areas or bull's-eye where there could be possible instrument problems for technicians to investigate. Due to the lack of funding, the programs were transferred to ATDD and the operation has been terminated at FRD. (Jason.Rich@noaa.gov)

Pocatello National Weather Service Ground Hog Day

Kirk Clawson and Jason Rich attended the 10th annual Ground Hog Day Meeting and Chili Cookoff on February 1. The meeting was sponsored by the Pocatello NWS Weather Forecast Office and was attended by locally-based federal, state, and county officials with interest in emergency management. Presentations from specialists included the subjects of WSR-88D dual polarization capability, water

supply outlook, spring flooding potential, and earthquake potential. The visit helped us to continue fostering our relationship with the Pocatello NWS, the State of Idaho INL Oversight Program, DOE-Idaho, Idaho National Laboratory, and other local entities. (Kirk.Clawson@noaa.gov and Jason Rich)

FRD/ATDD Cooperation on Wind Forecast Improvement

FRD and ATDD have been cooperating on analyzing data collected from sonic anemometers, sodars, and a radar wind profiler that were deployed in Texas during the Wind Forecast Improvement Program (WFIP). The field deployment covered the time period of July 2011 through September 2012. During the same time period, ATDD collected and stored HRRR output for the Texas study domain from ESRL. Will Pendergrass visited FRD on January 16 to discuss preliminary results of his analyses and to discuss future collaborative efforts.

NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP

Emergency Operations Center (EOC)

Team A participated in a drill held at the Emergency Operations Center on January 15. This first drill of the year centered on Fire that was located at the Materials and Fuels Complex. Several HYSPLIT model runs, current weather conditions and short-term forecasts were provided during the drill.

(Jason.Rich@noaa.gov)

INL Hazardous Weather Alert System

Only three NOAA INL Hazardous Weather Alerts were issued during the last quarter. All three of the alerts were issue for high winds. (Jason.Rich@noaa.gov)

NOAA/INL Mesonet

For approximately two weeks during January 2013, the radio network used to collect data from the NOAA/INL Mesonet was unable to collect data from many of the stations. The weather was very cold and the initial suspicion was that cold temperatures were affecting the operation of the radios. However, after attempting a number of different fixes, including placing heaters in some of the radio enclosures and doing radio checks and improvements at some stations, it was discovered that the communication problems were resolved by simply rebooting the Campbell Scientific data loggers that collect the measurements at each station. We surmise that there is an error in the data logger firmware which sometimes affects its ability to communicate over the radio network. The problem has been referred to Campbell Scientific but they have not yet given us an explanation or a fix to the problem. As an interim fix, data loggers will be rebooted during the semiannual calibration and maintenance of the station and whenever any repairs or maintenance is performed at the station. As a more permanent fix, the aspirator monitoring circuit (described in the first quarter report) is being extended so that it will periodically reboot the data loggers in an effort to prevent radio communication difficulties in the future.

(roger.carter@noaa.gov)

DOE-ID and INL COOP Exercise

Kirk Clawson participated in the multi-day DOE-ID and INL Continuity of Operations (COOP) exercise held March 26-28. The drill incorporated a severe winter weather scenario with an extended power outage. Activities included participating in briefings with senior DOE-ID management in the DOE-ID manager's conference room. (Kirk.Clawson@noaa.gov)

OTHER ACTIVITIES

Safety

At the March monthly staff meeting, employees viewed a video on chain saw safety.

The Homeland Security video of "If you See Something, Say something" was viewed at the February staff meeting.

An internet video "Being aware of your environment while walking/driving" was viewed during the January staff meeting.

Training

Rick Eckman completed the NOAA Leadership Effectiveness and Advancement Program (LEAP) in February. Due to budget constraints, no travel was authorized to attend the final training session held in Silver Spring, MD. Instead, remote class members attended through video teleconferencing.

The FY2013 NOAA Employee Safety and Environmental Awareness training was completed by all FRD employees.

Donna Davis participated in the WorkLife4You Webinar, Benefits of a Good Night's Sleep, in February.

Visitors

Will Pendergrass, meteorologist with NOAA's Atmospheric Turbulence and Diffusion Division in Oak Ridge, TN, March 26-28.

Travel

Kirk Clawson traveled to Austin Texas to attend the American Meteorologist Society (AMS) Annual Meeting January 6-10.